**Remarks**

Claims 1 to 5, 8, 10 to 13, 17 to 21 and 23 to 29 are in the application. Claims 6, 7, 9, 14 to 16 and 22 are cancelled. Claims 1, 4, 13, 17, 18, 19, 25 and 28 are amended. Claim 29 is new.

A clean version of the amended claim 1 is provided below:

> *A method of transmitting an audio stream, comprising:*
> *estimating a perceptual mask for the audio stream, the perceptual mask being based on a human auditory system perceptual threshold;*
> *dynamically allocating a hidden sub-channel substantially below the estimated perceptual mask for the audio stream, the dynamic allocation being based on characteristics of the audio stream; and*
> *generating a composite audio stream, the composite audio stream including uncoded narrowband components of the audio stream for which the perceptual mask was estimated, the composite audio stream further including additional payload in the hidden sub-channel, the uncoded narrowband components of the composite audio stream being audible to a human ear at a receiver without decoding; and*
> *transmitting the composite audio stream.*

Claim 1 now specifies that the composite audio stream that is generated by a method of the present invention includes <u>uncoded</u> narrow band components of the audio stream for which the perceptual mask was estimated. The composite audio stream also includes additional payload in the hidden sub-channel. Furthermore, claim 1 specifies that the uncoded narrow band components of the composite audio stream are audible to a human ear at a receiver without decoding. Independent claims 17, 19, 25 and 28 have been amended to included some or all of these features.

The Examiner has rejected claims 1 to 28 under 35 USC 102(b) as being anticipated by Kim et al. ("A New Bandwidth scalable wideband speech/audio coder", proceedings of IEEE International Conference on Acoustics, Speech, and Singal Processing, Orlando, Florida,

USA, May 13-17, 2002, pages 657-660). The Applicant disagrees and provides the following comments and arguments.

As recited in amended claim 1, the claimed invention generates and transmits a composite audio stream which includes uncoded narrowband components of the audio stream for which a perceptual mask was estimated. The composite audio stream also includes additional payload in a hidden sub-channel. This additional payload can relate to data for providing a concurrent service such as in claim 12, or can be based on an encoded upper band portion of the audio stream, as in recited in claims 25, 28 and 29. The additional payload is combined with the uncoded narrowband components to produce the composite audio stream. The composite audio stream includes the narrowband components which are audible to a human ear at a receiver, such as a headphone or telephone earpiece, without decoding. A decoder is only needed to restore the full wideband signal represented by the audio stream.

On the other hand, the method in Kim et al. encodes <u>both</u> the higher and lower band portions of the wideband signal. Moreover, Kim et al. outputs a <u>digital bit stream</u>, which must be decoded before being able to understood by the human ear. In other words, a decoder is needed no matter what. Furthermore, the approach in Kim et al. requires that the output speech of the decoder be actively selected to be narrowband or wideband coding according to the channel conditions. In contrast, the system of the present invention is backwards compatible with narrowband systems and can advantageously make use of wideband information as well.

With respect to the steps in claim 1, Kim et al. does not explicitly estimate an actual perceptual mask. They only make use of a *temporal* making property of the human ear (lines 1 and 2 of the second column of page I-659), while the present invention explicitly calculates a perceptual mask, such as a *frequency* mask. Kim et al. does not dynamically allocate a hidden sub-channel in their proposed method. In contrast, they use an *explicit* (non-hidden or physically real) extra channel in addition to the channel for the encoded lower band signal (needed by ITU-T G.729 Annex E) to transmit the higher band information. This differs from the present invention in which only the existing channel capacity is used to transmit the additional payload, without needing additional physical channel capacity. The method of Kim et al. does not transmit anything in a "hidden" channel, which is does not possess; it does so

in an explicit extra physical channel, as stated above. Kim et al. does not generate a composite audio stream that includes uncoded narrowband components of the audio streams that was input to the method. Instead, Kim et al. applies independent coding schemes to the lower band and higher band signals.

In summary, the present invention transmits an uncoded narrow band portion of an original wideband audio stream and adds additional payload in a hidden sub-channel within the narrow band components. Kim et al. encodes both higher band and lower band portions of an original wideband signal. Only a higher band of an original wideband audio stream is encoded according to an embodiment of the present invention. The encoded higher band information is embedded into the lower band signal according to the present invention, whereas it is not in Kim et al. Instead, Kim et al. requires an additional physical channel, i.e. extra channel bandwidth, to transmit encoded higher band information or additional payload, which is not the case in the present invention. The present invention outputs a digitized waveform of a lower band signal, which can be heard without a decoder. Kim et al. outputs a digital bit stream, for which a decoder must be used in order for a user to hear the output format. The present invention is compatible with existing plain ordinary telephone system (POTS), whereas the method of Kim et al. is not.

The Applicant submits that at least because of the above differences between Kim et al. and the present invention, Kim et al. cannot anticipate the claimed invention. Moreover, since the approach in Kim et al. teaches away from the approach of the present invention, Kim et al. neither discloses nor suggests the subject matter in independent claim 1 or in any of the other independent claims. The dependent claims include the features of the independent claims by virtue of their dependence thereon. Accordingly, withdrawal of the rejection under 35 USC 103(b) is respectfully requested.

Figure 1 has been amended in order to designate this figure as prior art. Withdrawal of the objection to the drawings is therefore respectfully requested.

The specification has been amended to correct minor typographical omissions in paragraphs [00142] and [0148], to provide continuity in the numbered lists.

The Applicant submits that the present application is now in condition for allowance and looks forward to receiving a Notice of Allowability. The Examiner is encouraged to contact the undersigned by telephone in order to discuss any matter that may bring this case to allowance.

No fee is believed due for this submission.  However, Applicant authorizes the Commissioner to debit any required fee from Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP.  The Commissioner is further authorized to debit any additional amount required, and to credit any overpayment to the above-noted deposit account.

Respectfully submitted,

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